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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/803,221	03/18/2004	Shigenori Ito	811_045	5630
25191	7590	08/31/2007		
BURR & BROWN PO BOX 7068 SYRACUSE, NY 13261-7068			EXAMINER CREPEAU, JONATHAN	
			ART UNIT 1745	PAPER NUMBER
			MAIL DATE 08/31/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/803,221	ITO ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Jonathan S. Crepeau	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 11 June 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 34 is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                                  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____   |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 11, 2007on has been entered.

This Office action addresses claims 1-3 and 34. Claim 34 remains allowed. Applicants' amendments have obviated the rejection over Nishi. However, claims 1-3 are newly rejected under 35 USC 103. This action is non-final.

### ***Claim Rejections - 35 USC § 103***

2. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 8-050913 in view of Tannenberger et al (U.S. Patent 5,328,779) in view of Ruka et al (U.S. Patent 5,908,713).

JP '913 is directed to tubular solid oxide fuel cell comprising an air electrode (23) comprising a perovskite-type lanthanum base oxide, an electrolyte (25) comprising YSZ, and a fuel electrode (26) comprising nickel (see [0013] and [0016] of translation). The air electrode is a self-supporting substrate, and the entire main surface of each electrode is contacted by the

electrolyte. The fuel cells are made by a process wherein the air electrode (22) and interconnector (23) are extruded and integrally sintered, the electrolyte is coated thereon and sintered, and the fuel electrode is coated thereon and sintered, thereby resulting in a “laminated sintered body.” Regarding claim 3, this claim is considered to be product-by-process claim that does not produce a structure distinguishable from that of the references (MPEP 2113).

JP ‘913 does not expressly teach that the air electrode has a thickness of at least 300 microns, or that the electrolyte has a thickness of less than 25 microns, as recited in claim 1. The reference further does not teach that the laminated sintered bodies have an area of 60 square centimeters as recited in claim 2.

However, the artisan would be motivated to use a relatively thick air electrode support tube and a relatively thin electrolyte in the fuel cell of JP ‘913. A thicker electrode would provide increased mechanical strength, particularly since it is used as a support structure, while a thinner electrolyte would provide decreased internal resistance (support tube thicknesses are discussed with regard to prior art fuel cells in [0004]). It has been held that the discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. *In re Boesch*, 205 USPQ 215 (CCPA 1980). As such, the claimed thicknesses are not considered to distinguish over the reference. Regarding claim 2, the recitation of an absolute size (surface area) of the sintered body is also not considered to distinguish over the reference. Generally, an artisan would be able to scale up or down the size of an apparatus depending on its intended use, among other factors. See MPEP 2144.04.

JP '913 further does not expressly teach the claimed helium leakage rate of the zirconia electrolyte layer as recited in claim 1.

Tannenberger et al. is directed to a fuel cell comprising an electrolyte layer (2) comprising YSZ. The electrolyte layer a helium leakage rate of  $10^{-6}$  mbar.l/cm.s (see col. 6, line 20).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use a YSZ electrolyte in the fuel cell of JP '913 having the helium leakage rate disclosed by Tannenberger et al. In column 4, line 16, Tannenberger et al. disclose that "advantageously, the electrolyte layer produced by the process according to the invention has a layer thickness optimized for the oxygen ion conductivity and simultaneously the necessary gastightness." As such, the artisan would be motivated to use a YSZ electrolyte in the fuel cell of JP '913 having the helium leakage rate disclosed by Tannenberger et al. Although the units of the helium leakage rate disclosed by Tannenberger et al. are slightly different than the units recited in the instant claims, it is submitted that the disclosure of Tannenberger at least identifies the helium leakage rate as a result effective variable which may be optimized by the skilled artisan as stated above. Further, it is submitted that, absent evidence to the contrary, there would be a reasonable expectation that the range disclosed by the reference and the claimed range overlap. It is noted that the Tannenberger reference does not explicitly state how its helium leakage rate is measured, whereas the instant application discloses a specific method in [0124].

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JP '913 further does not expressly teach that the fuel electrode comprises any of the claimed materials, i.e., a nickel-zirconia cermet or a nickel-cerium oxide cermet.

Ruka et al., in a discussion of the prior art, discloses the following at col. 1, line 55:

Nickel plus yttria-stabilized zirconia cermet fuel electrodes have been studied and used for many years as a means to improve thermal expansion match of the anode and electrolyte, and to minimize the effect of oversintering of nickel, which can result in poorer adherence due to a reduction of points of contact of nickel particles with the electrolyte, poorer electrochemical performance, and separation of the anode from the electrolyte during thermal cycles which can occur during fabrication and maintenance procedures. One type of Ni/YSZ cermet used in solid oxide

Accordingly, the skilled artisan would be motivated to replace the nickel electrode of JP '913 with a nickel/zirconia cermet, in hopes obtaining these advantages.

### *Conclusion*

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan, can be reached at (571) 272-1292. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (571) 273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jonathan Crepeau  
Primary Examiner  
Art Unit 1745  
August 29, 2007